

Roll No. 

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Total No. of Pages : 02

Total No. of Questions : 18

Pharm. D (PCB Students) (Sem.-1)

**REMEDIAL MATHEMATICS**

Subject Code : 1.6

Paper ID : [D0170]

Time : 3 Hrs.

Max. Marks : 70

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A contain SEVEN questions. Attempt any FIVE questions. Each question will carry TWO marks each.
2. SECTION-B contain EIGHT questions (Short Essay Type). Attempt any SIX questions. Each question will carry FIVE marks.
3. SECTION-C contain THREE questions (Long Essay Type). Attempt any TWO questions. Each question will carry FIFTEEN marks.

**SECTION-A**

1. If  $y = \sqrt{x}$ , then find  $\frac{dy}{dx}$ .
2. Differentiate  $x^{1/3} \cos(x)$  w.r.t.  $x$ .
3. What is order and degree of differential equation  $\frac{d^2y}{dx^2} = x^2 \sin^2(x) + x^3 + y$ .
4. Write Laplace Transformation of  $\sin(ax)$ .
5. Evaluate  $\int (e^x + ex + x^e) dx$ .
6. Construct a  $2 \times 2$  matrix  $A = [a_{ij}]$ , such that  $a_{ij} = i - j$ .
7. Write the equation of parabola with latus rectum 2 and vertex (0, 0).

**SECTION-B**

8. Write Laplace Transformation of  $\left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^3$ .
9. Derive the equation of straight line passing through two points (1, -1) & (2, 3).
10. If  $u = \frac{x}{y}$  then find  $\frac{\partial u}{\partial x}$ ,  $\frac{\partial u}{\partial y}$ ,  $\frac{\partial^2 u}{\partial x^2}$  and  $\frac{\partial^2 u}{\partial y^2}$ .
11. Find  $n^{\text{th}}$  derivative of  $e^{-ax}$ .
12. Evaluate  $\int e^x \sec^2(e^x) dx$ , by substitution method.
13. Solve the differential equation  $\cos(y) dy + \cos(x) \sin(y) dx = 0$ .
14. Without expanding, find the value of  $\begin{vmatrix} 1 & a & b+c \\ 1 & b & a+c \\ 1 & c & a+b \end{vmatrix}$ .
15. Differentiate  $\frac{(x+2)}{(x^2-3)}$ , and find the value of derivative at  $x = 0$ .

**SECTION-C**

16. If  $y = x^{x^{x^{\dots \text{to } \infty}}}$ , then prove that  $\frac{dy}{dx} = \frac{y^2}{x(1 - y \log x)}$ .
17. Find Laplace Transformation of  $te^{-t} \cos(2t)$ .
18. Evaluate  $\int x^3 e^x dx$  by parts.